

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1-29 are pending in the application, with claims 1, 16 and 28 being independent. Claims 1-16, 28 and 29 are currently amended with support for the claim amendments found in the original disclosure. Claim 35 is new with support found in the original disclosure. No new matter has been added. Favorable consideration is respectfully requested.

Claim Objection

Claims 16-27 stand objected to based on an informality. Applicant has addressed the formality in independent claim 16, as suggested by the Office and therefore, the informalities with dependent claims 17-27 are also addressed. Accordingly, Applicant respectfully requests that the objection be reconsidered and withdrawn.

§101 Rejection

Claims 1-15, 28 and 29 stand rejected under 35 U.S.C. § 101 as purportedly being directed to non-statutory subject matter. For the sole purpose of expediting prosecution of the present application to allowance and without conceding the propriety of the Office's rejection, Applicant has amended claims 1-15 to address the rejections. Moreover, claim 28 has been amended to recite, in part, “[a] computer-implemented method for approximating a solution to a linear program to analyze network data routes for data dissemination-stored in a computer

readable storage medium having computer-executable instructions, that, when executed, causes one or more processors to perform the following....”

Accordingly, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

§112 Second Paragraph Rejection

Claims 1-15, 28 and 29 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite. For the sole purpose of expediting prosecution of the present application to allowance and without conceding the propriety of the Office’s rejection, Applicant has amended independent claim 1 in the manner suggested by the Office to address the rejection. Moreover, independent 28 is currently amended to recite a computer readable storage medium.

Accordingly, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

Cited References

The following references have been applied to reject one or more claims of the Application:

- **Williamson:** Williamson et al., “A Primal-Dual Approximation Algorithm for Generalized Steiner Network Problems” 25th ACM STOC (1993), pp. 708-717
- **Karr:** Karr et al., “Derivation of the Ellipsoid Algorithm”, Duke University Technical Report CS-1991-17 (1990)

- **Hougardy:** Hougardy et al., "A 1.598 Approximation Algorithm for the Steiner Problem in Graphics", Proceedings of the Tenth Annual ACM-SIAM Symposium on Discrete Algorithms (1999), pp. 448-453

§103(a) Rejection

Claims 1, 2 and 5-14

Claims 1, 2 and 5-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of the Office's Official Notices. Based on the following, Applicant respectfully traverses the rejection and further requests that the rejection be reconsidered and withdrawn.

As currently amended, independent **claim 1** is reproduced below:

A system, comprising:

 a server including at least one processor and at least one computer-readable storage medium, the computer-readable storage medium comprising:

 a component that receives a subset of data corresponding to the linear program;

 a component that receives a user input for a selection of at least one of the subset of data, the at least one of the subset of data associated with one or more of cost, length, bandwidth or latency; and

 an analysis component that adapts linear programming optimization algorithms, based on separation oracle(s), to work with an approximate separation oracle and the at least one of the subset of data to solve a primal and dual linear program within a same approximation factor as the approximate separation oracle.

Applicant respectfully submits that Williamson does not teach or suggest the features of independent claim 1.

The Office acknowledges that Williamson "does not explicitly disclose a user input that receives a selection of at least one of the subset of data, (Final Office Action, pg. 7). The Office continues, "[h]owever, the data variables of Williamson are not defined, and are intended to be defined based on the particular situation of the problem to be solved...Williamson discloses the claimed linear programming formula with variables; a user of the formula would know that he is supposed to 'input' of [sic] substitute data particular to his situation for the formula variables...Examiner takes Official Notice that it was well-known in the art at the time the invention was made to input actual data into formula variables in order to solve a formula for a particular situation...[f]urthermore, Examiner takes Official Notice that it was well-known in the art at the time the invention was made to perform such inputting user a computer...Examiner takes Official Notice that it was well-known in the art at the time the invention was made to automate processes," *id.* Applicant takes exception to the use of multiple Official Notices in the rejection of these claims as being improper based on the following reasons.

Williamson is limited to describing the methodology of polynomial-time approximation algorithms for find a minimum-cost subgraph having at least a specified number of edges in each cut (Williamson, Abstract). However, nowhere in Williamson does it teach or suggest, at least, "a component that receives a user input for a selection of at least one of the subset of data, the at least one of the subset of data associated with one or more of cost, length, bandwidth or latency...," as currently recited in claim 1. Contrary to the Office's

contention, the user input is not limited to merely substituting data for formula variables since, *inter alia*, the formula variables disclosed in Williamson do not teach or suggest data associated with cost, length, bandwidth or latency. Williamson lacks formula variables associated with the parameters recited in claim 1, and therefore fail to consider the same when solving a primal and dual linear approximation algorithm. Rather, Williamson merely utilizes variables directed to “minimum-cost subgraphs such that the number of edges crossing each cut is at least a specified requirement, which is some function of the cut,” (Williamson, Introduction, pg. 1). In other words, without formula variables to factor in data associated with one or more of cost, length, bandwidth or latency Williamson fails to teach or suggest, at least, the features of the component that receives a user input....,” as defined in claim 1.

Moreover, the Office’s Official Notices that “it was well-known in the art at the time the invention was made to input actual data into formula variables in order to solve a formula for a particular situation,” “perform such inputting using a computer” and “to automate processes” are wholly unsupported and improper. The Office has failed to show any documentary evidence to support the aforementioned statements, and Applicant respectfully points out that the instant application is the only objectively verifiable cited document of record that shows or suggests what the Examiner purports is well known and expected in the art.

Based on the foregoing, Applicant respectfully submits that the pending claims are patentable over Williamson.

Claims 2 and 5-14 depend from independent claim 1 and therefore are also patentable over Williamson by virtue of, at least, their respective dependencies. Applicant also respectfully requests individual consideration for each dependent claim.

For example, dependent **claim 6** recites, in part, “wherein, the approximation separation oracle is utilized in conjunction with an ellipsoid method to obtain a resolution for the primal and dual linear programs.” Applicant respectfully submits that the Official Notice taken by the Office in this instance is entirely improper. Insofar that Applicant has shown above with respect to the standing rejection of parent claim 1, that Williamson is different from the features recited in claim 1, Applicant has been unable to discern any teaching or suggestion in Williamson regarding the recited features of claim 6. For example, Williamson does not teach or suggest, at least, “the approximation separation oracle is utilized in conjunction with an ellipsoid method to obtain a resolution for the primal and dual linear programs.”

Claims 3, 4, 16-19 and 21-29

Claims 3, 4, 16-19 and 21-29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of Karr. Based on the following, Applicant respectfully traverses the rejection.

Claims 3 and 4 depend from independent claim 1 and therefore include the feature, “a component that receives a user input for a selection of at least one of the subset of data, the at least one of the subset of data associated with one or more of cost, length, bandwidth or latency...”

As provided with respect to the discussion regarding independent claim 1 hereinabove, Williamson fails to teach or suggest the aforementioned feature. Applicant further submits that Karr provides no assistance in light of Williamson with respect to claims 3 and 4, since Karr fails to rectify the deficiency of Williamson. Karr merely presents an informal derivational framework for linear programming algorithms and derive the ellipsoid method using the ideas of this framework (Karr, Abstract). Specifically, like Williamson, Karr is silent with respect to, at least, "at least one of the subset of data associated with one or more of cost, length, bandwidth or latency..., as recited in claim 1 and included in claims 3 and 4. As such, Applicant respectfully submits that Karr does not compensate for the deficiencies of Williamson, relative to claims 3 and 4.

Moreover, Applicant respectfully submits that the Official Notice taken by the Office with respect to dependent claim 3 is improper insofar that Applicant has shown above that Williamson is different to the features recited in parent claim 1. Applicant has been unable to discern any teaching or suggestion in Williamson regarding the features recited in claim 3. Further, Applicant respectfully points out that the instant application is the only objectively verifiable cited document of record that shows or suggests what the Office purports is well known in the art.

Based on the foregoing, Applicant respectfully traverses the rejection with respect to claims 3-4 and respectfully requests that the rejection be reconsidered and withdrawn.

Claims 16 and 28

Independent claims 16 and 28 have been amended, and are reproduced as follows:

16. A computer-implemented method, implemented by one or more processors, comprising:

obtaining desired parameter data from a networked system for utilization in determining an optimum distribution, the desired parameter data being pre-selected;

receiving a selection of at least one of the desired parameter data;

determining the optimum distribution utilizing an approximate separation oracle and the at least one of the desired parameter data in an ellipsoid method to solve primal and dual linear programs that represent a fractional Steiner tree packing problem.

28. A computer readable storage medium having computer-executable instructions, that, when executed, cause one or more processors to perform operations comprising:

approximating an algorithmic solution to a minimum weight Steiner tree problem with a known approximation method;

receiving a selection of at least one parameter corresponding to the linear program, the selection associated with one or more of cost, length, bandwidth or latency;

collecting data associated with the at least one parameter, the data comprising a link capacity of a network data route for data dissemination;

obtaining an approximate separation oracle for the algorithmic solution, the approximate separation oracle being the known approximation method and indicating whether a solution is feasible or not; and

utilizing the approximate separation oracle and the data associated with the at least one parameter in an ellipsoid method to resolve primal and dual linear programs representative of a fractional Steiner packing tree problem to provide an optimal data dissemination for the network data route.

Applicant respectfully submits that the cited combination of Williamson and Karr do not teach or suggest the recited features of these independent claims. Specifically, the cited combination fails to teach or suggest, at least, "obtaining desired parameter data from a networked system for utilization in determining an optimum distribution, the desired parameter data being pre-selected," as recited in claim 16 or, "receiving a selection of at least one parameter corresponding to the linear program, the selection associated with one or more of cost, length, bandwidth or latency," as recited in claim 28.

Similar to the discussion regarding the standing §103(a) rejection of claim 1 detailed above, Williamson is limited to describing the methodology of polynomial-time approximation algorithms for find a minimum-cost subgraph having at least a specified number of edges in each cut (Williamson, Abstract). As such, Williamson is silent with respect to both pre-selected parameters and receiving a selection of at least one parameter associated with one or more of cost, length, bandwidth or latency.

As mentioned above, Williamson lacks formula variables associated with the parameters recited in claim 28, and therefore fails to consider the same when solving a primal and dual linear approximation algorithm. With respect to claim 16, Applicant respectfully submits that Williamson also fails to teach or suggest the pre-selection feature defined in the rejected claim based in the reasons provided above. Moreover, Applicant respectfully disagrees with the Office's contention that "it was well-known in the art at the time the invention was made to perform such inputting using a computer" since the features recited in claims 16 and 28 are far more than the mere automation of the purported process as described in Williamson, (Final Office Action, pg. 7). In other words, Applicant respectfully submits that

the pre-selection of parameter data and the associated parameter selections of claims 16 and 18, respectively are not a “well-known” part of automating the aforementioned process. Furthermore, the Office has failed to show any documentary evidence to support the aforementioned statements, and Applicant respectfully points out that the instant application is the only objectively verifiable cited document of record that shows or suggests what the Examiner purports is well known and expected in the art.

Applicant further submits that Karr provides no assistance in light of Williamson with respect to claims 16 and 28 since Karr fails to rectify the deficiencies of Williamson. Karr merely presents an informal derivational framework for linear programming algorithms and derive the ellipsoid method using the ideas of this framework (Karr, Abstract). Moreover, like Williamson, Karr is silent with respect to, at least, receiving a selection of parameter data/parameters, as recited in claims 16 and 28, respectively. As such, Applicant respectfully submits that Karr does not compensate for the deficiencies of Williamson, relative to claims 16 and 28.

Accordingly, based in part on the current amendments to independent claims 16 and 28, Applicant respectfully submits that claims 16 and 28 are patentable over Williamson.

Claims 17-19, 21-27 and 29 depend from either independent claim 16 or 28, and therefore are also patentable over the proposed combination of references by virtue of, at least, their respective dependencies. Applicant also respectfully requests individual consideration for each dependent claim.

Moreover, Applicant respectfully submits that the Official Notice taken by the Office with respect to dependent claims 17 and 19 are improper insofar that Applicant has shown above that Williamson is different to the features recited in parent claim 1. Applicant has been

unable to discern any teaching or suggestion in Williamson regarding the features recited in the subject claims. Further, Applicant respectfully points out that the instant application is the only objectively verifiable cited document of record that shows or suggests what the Office purports is well known in the art.

Claim 15

Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of Hougardy. Based on the following, Applicant respectfully traverses the rejection.

Claim 15 depends from claim 1 and therefore includes the feature, “a component that receives a user input for a selection of at least one of the subset of data, the at least one of the subset of data associated with one or more of cost, length, bandwidth or latency...” As provided with respect to independent claim 1, Williamson fails to teach or suggest the aforementioned feature. Applicant further submits that Hougardy provides no assistance in light of Williamson with respect to claim 15 since Hougardy fails to rectify the deficiency of Williamson. Hougardy merely describes a specific framework for improving the performance ratio of Steiner tree approximation algorithms (Hougardy, Abstract). Moreover, like Williamson, Hougardy is silent with respect to, at least, “a component that receives a user input for a selection of at least one of the subset of data, the at least one of the subset of data associated with one or more of cost, length, bandwidth or latency...,” as recited in claim 1 and included in claim 15. As such, Applicant respectfully submits that Hougardy does not compensate for the deficiencies of Williamson, relative to claim 15.

Based on the foregoing, Applicant respectfully traverses the rejection with respect to claim 15 and respectfully requests that the rejection be reconsidered and withdrawn.

Claim 20

Claim 20 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of Karr and in further view of Hougardy. Based on the following, Applicant respectfully traverses the rejection.

Claim 20 depends from claim 16 and therefore includes the feature, “obtaining desired parameter data from a networked system for utilization in determining an optimum distribution, the desired parameter data being pre-selected...” As provided with respect to independent claim 16, the cited combination of Williamson and Karr fails to teach or suggest the aforementioned feature. Applicant further submits that Hougardy provides no assistance in light of the cited combination of references with respect to claim 20 since Hougardy fails to rectify the deficiencies of Williamson and Karr. Hougardy merely describes a specific framework for improving the performance ratio of Steiner tree approximation algorithms (Hougardy, Abstract). Moreover, like Williamson and Karr, Hougardy is silent with respect to, at least, “obtaining desired parameter data from a networked system for utilization in determining an optimum distribution, the desired parameter data being pre-selected...” as recited in claim 16 and included in claim 20. As such, Applicant respectfully submits that Hougardy does not compensate for the aforementioned deficiencies of Williamson and Karr, relative to claim 20.

CONCLUSION

For at least the foregoing reasons, it is respectfully submitted that claims 1-29 and 35 are in condition for allowance and a Notice to that effect is earnestly solicited. However, if there are any remaining matters that may be handled by a telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

Respectfully Submitted,

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